**U.S. FISH AND WILDLIFE SERVICE**
**SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM**

SCIENTIFIC NAME: *Dalea carthagenensis* (Jacq.) J.F. Macbr. var. *floridana* (Rydb.) Barneby

COMMON NAME: Florida prairie-clover (= Cartagena prairieclover)

LEAD REGION: 4

INFORMATION CURRENT AS OF: October 2005

STATUS/ACTION:

___ Species assessment - determined species did not meet the definition of endangered or threatened under the Act and, therefore, was not elevated to Candidate status

___ New candidate

_X_ Continuing candidate

___ Non-petitioned

X__ Petitioned - Date petition received: May 11, 2004

__ 90-day positive - FR date:

__ 12-month warranted but precluded - FR date:

__ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:

a. Is listing warranted (if yes, see summary of threats below)? yes

b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? yes

c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded. We find that the immediate issuance of a proposed rule and timely promulgation of a final rule for this species has been, for the preceding 12 months, and continues to be, precluded by higher priority listing actions (including candidate species with lower LPNs). During the past 12 months, almost our entire national listing budget has been consumed by work on various listing actions to comply with court orders and court-approved settlement agreements, meeting statutory deadlines for petition findings or listing determinations, emergency listing evaluations and determinations, and essential litigation-related, administrative, and program management tasks. We will continue to monitor the status of this species as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures. For information on listing actions taken over the past 12 months, see the discussion of "Progress on Revising the Lists," in the current CNOR which can be viewed on our Internet website (http://endangered.fws.gov/).

_X__ Listing priority change

Former LP: ___

New LP: ___

Date when the species first became a Candidate (as currently defined): October 25, 1999

___ Candidate removal: Former LP: ___

___ A - Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.

___ F - Range is no longer a U.S. territory.

___ I - Insufficient information exists on biological vulnerability and threats to support listing.

___ M - Taxon mistakenly included in past notice of review.

___ N - Taxon may not meet the Act's definition of "species."

___ X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Flowering plants, Fabaceae (Leguminosae), Pea Family

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Florida, U.S.A.

CURRENT STATES/ COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Florida, Collier, Miami-Dade, and Monroe Counties, U.S.A.

LAND OWNERSHIP: Most of the known sites for *Dalea carthagenensis* var. *floridana* are on conservation lands. There are two populations in the Big Cypress National Preserve (in Collier County and the mainland portion of Monroe County). In Miami-Dade County, there are two populations at the Deering Estate at Cutler (a.k.a. Charles Deering Estate), and one at the R. Hardy Matheson Preserve. Both of these sites are owned by Miami-Dade County. Populations discovered in 2005 are on land owned by the Miami-Dade County Public Health Trust and by the local, privately owned electric utility company, and on another privately owned tract.

LEAD REGION CONTACT: Richard Gooch, 404-679-4124

LEAD FIELD OFFICE CONTACT: South Florida Ecological Services Office, David Martin, 772-562-3909 ext 230

BIOLOGICAL INFORMATION:

Species Description: *Dalea carthagenensis* var. *floridana* is a semiwoody (suffrutescent) plant 0.5-2 meters (3-6 feet) tall with small pea-like flowers borne in spikes. "Leaflets are 15-23, ovate to elliptic, 1-14 mm long, glandular punctuate beneath; spikes subcaptitate to shortly oblong, 0.5-1.5 (-2) cm long, pubescent; peduncles opposite the leaves, terminal or appearing axillary, 1-3.5 cm long; bracts shorter than calyx; calyx 5-7 mm long, subequal and exceeding

the tube, plumose; corolla subpapillionaceous, initially greenish white, turning maroon or dull purple, 4-5 mm long; stamens 9-10." (Bradley and Gann 1999, adapted from Isely 1990). Research at Fairchild Tropical Botanic Garden shows that both boiling water and sulfuric acid (which are standard scarification treatments) expedite seed germination in this species (Carroll 2005).

Taxonomy: As noted in the Missouri Botanical Garden's (2003) nomenclatural database, the systematics of Florida prairie-clover were revised by the late Rupert Barneby of the New York Botanical Garden (1977). *D. carthagenensis* var. *floridana* was recognized as a Florida endemic. The late Robert Isely adopted Barneby's treatment for his 1990 legume flora of the Southeast.

Habitat: This shrub is found in edges of rockland hammock and pine rockland, coastal upland, and marl prairie. "Fire is probably very important to the livelihood of this taxon. Plants probably do not tolerate shading by hardwoods in the absence of periodic fires. Two of the extirpated occurrences were reported from rockland hammocks (Castellow Hammock and Cox Hammock). Plants probably occurred at the edges of these hammocks. . . At least one of the Palm Beach collections was made in some type of coastal upland." (Bradley and Gann 1999). This species occurs in association with south Florida slash pine (*Pinus elliottii* var. *densa*), live oak (*Quercus virginiana*), gumbo-limbo (*Bursera simaruba*), poisonwood (*Metopium toxiferum*), willow bustic (*Sideroxylon celastrinum*), white stopper (*Eugenia axillaris*), bluestem grasses (*Schizachyrium* spp.), and paspalum grasses (*Paspalum* spp.) (Bradley and Gann 1999).

Historical Range/Distribution: "*D. carthagenensis* var. *floridana* was historically known from Miami-Dade, Collier, Monroe, and Palm Beach Counties. Collections were made in Palm Beach County at an unknown location near Palm Beach by Curtiss in 1895, and south of Palm Beach by Small in 1918. In Monroe County it has been known historically from the Pinecrest region in the Big Cypress National Preserve. It was discovered in [the] Collier County portion of the Big Cypress National Preserve in 1999 (Bradley 1999)." (Bradley and Gann 1999). There have been no further reports of this plant from Palm Beach County since 1918. In Miami-Dade County, this plant was reported from many locations, including Key Biscayne, Castellow Hammock, the Charles Deering Estate, R. Hardy Matheson Preserve, the edge of Everglades National Park, the Coral Gables area, pinelands south of the Miami River, and Cox Hammock (Bradley and Gann 1999). Gann et al. (2002) accounted for essentially every herbarium specimen and reliable sighting.

Current Range/Distribution: At least three localities exist in Big Cypress National Preserve in Collier County and the mainland portion of Monroe County, including a new population discovered in the vicinity of Raccoon Point along 11 Mile Road in Collier County, found by Steve Woodmansee and Jimi Sadle (K. Bradley, The Institute for Regional Conservation, pers. comm. 2005). Population sizes have not yet been fully estimated or threats fully assessed. There is an unconfirmed report of this species in Florida Panther National Wildlife Refuge, which is also in the Big Cypress region (Bradley in litt. 2005).

In Miami-Dade County, there are two colonies on public conservation lands at the Deering Estate at Cutler, and one colony at the R. Hardy Matheson Preserve (not the same as Matheson Hammock Park), which adjoins Fairchild Tropical Garden. The Deering and Matheson properties adjoin Biscayne Bay. Another population was found in Crandon Park on Key Biscayne by a field botanist with Fairchild Tropical Botanic Garden. The species had last been collected or seen at Crandon Park in 1966. Some of the other Miami area sites where *Dalea carthagenensis* var. *floridana* was once collected still exist. The Institute for Regional Conservation discovered three new populations during their survey of Natural Forest Communities (NFC's) in Miami-Dade County. Some of these stations are outside of the NFC boundaries, so they are not included in the main NFC database (K. Bradley, The Institute for Regional Conservation, pers. comm. 2005). Their locations are:

- On the edge of a privately owned hammock on the north edge of 210 St. between 119 and 121 Ave.
- On the edge of a hammock owned by the Miami-Dade County Public Health Trust, the site of a health facility, at 216 St. and 102 Ave.
- On property owned by Florida Power and Light Co. between the Black Creek Canal and SW 214 St., between 112 and 113 Ave.

Population Estimates/Status: The number of plants has been estimated at fewer than 1,000, perhaps about 200 to 300. All except the three sites discovered in 2005 are protected (Bradley and Gann 1999). This assessment of population sizes remains accurate for Miami-Dade County following mapping of NFCs by The Institute for Regional Conservation in 2004. Estimates of population size and status in the Big Cypress region await further field work (Bradley in litt. 2005). Bradley notes that they found *D. carthagenensis* next to off-road vehicle trails and that the species was "trying to recruit in them," although any plant growing on a trail will be hit by the vehicles.

THREATS:

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Most of *Dalea carthagenensis* var. *floridana*'s habitat outside of the Big Cypress region has been destroyed by human activity. Pine rocklands in Miami-Dade County were reduced to about 11 percent of their former extent by 1996 (Kernan and Bradley 1996). Of the estimated historical extent of 74,000 hectares (ha) (182,780 acres), only 8,140 ha (20,106 acres) of pine rocklands remained in 1996. Outside of the Everglades National Park, only about one percent of the Miami Rock Ridge pinelands escaped clearing, and the remaining pinelands are in small remnant blocks isolated from other natural areas (Herndon 1998). Digital mapping of Miami-Dade County's NFCs in 2004 confirms that Herndon's estimate was accurate, and also demonstrates that nearly half of the remaining privately-owned pinelands had been destroyed or degraded. Degradation of NFCs is exemplified by a privately-owned site where *D. carthagenensis* was found by Keith Bradley. His comments were "this site is rapidly being lost to exotic pest plants. Very badly impacted by disturbance and exotics. Pinnacle rock areas with tall *Ficus* [native fig] canopy are restorable, but often have dense coverage of exotics. *Dalea*

*carthagenensis* var. *floridana* found on edge . . ." This site was also partly bulldozed in 2005, although the *Dalea* plants were unharmed (J. Possley, Fairchild Tropical Botanic Garden, pers. comm. 2005). Part of the Miami-Dade County Health Department site with this species was cleared in 2004. *D. carthagenensis* was not affected, but the site appears vulnerable.

During 2004, new information from Big Cypress National Preserve showed that *D. carthagenensis* is present at three or more sites. This species has also been found at the edges of off road vehicle trails, with seedlings appearing within trails. The extent to which trail use may affect *D. carthagenensis* cannot be appraised until survey work is more complete and management of the trail system can be evaluated. The Preserve manages off-road vehicle access using a permit system, regulations, and designated trails.

B. Overutilization for commercial, recreational, scientific, or educational purposes. None known.

C. Disease or predation. This species is being parasitized by the introduced insect lobate lac scale at some localities (e.g., R. Hardy Matheson Preserve) (K. Bradley in litt. 2005). This scale insect is attacking and damaging or killing many native plants, and is not yet controlled, despite an active biological control program conducted by the U.S. Department of Agriculture.

D. The inadequacy of existing regulatory mechanisms. The Florida Department of Agriculture and Consumer Services designated *Dalea carthagenensis* as endangered under Chapter 5B-40, Florida Administrative Code. This listing provides little or no habitat protection beyond the State's Development of Regional Impact process, which serves to disclose impacts from projects, but provides no regulatory protection for State-listed plants on private lands. Without local or county ordinances preventing the destruction of the plant, conservation does not occur.

E. Other natural or manmade factors affecting its continued existence. Fire suppression and invasive exotic plants are the greatest threats to *Dalea carthagenensis* var. *floridana*. Fire is required to maintain the pine vegetation and keep hardwoods from encroaching. Under natural conditions, lightning fires typically occurred at 3- to 7-year intervals. With fire suppression, hardwoods eventually invade pine rocklands and shade out understory species like *Dalea carthagenensis* var. *floridana*. In Miami-Dade County, fire suppression has reduced the size of the areas that do burn and habitat fragmentation due to urbanization and agricultural development has prevented fire from moving across the landscape in a natural way. Thus, many pine rocklands have become tropical hardwood hammocks. Invasive exotic plant species have contributed to conservation problems in Miami-Dade County by altering the type of fire that occurs in pine rocklands. Historically, the low, open understories of pine rocklands had patchy natural fires with relatively low temperatures, sparing many plants such as *Dalea carthagenensis* var. *floridana*. Dense growths of exotic plants can result in high fire temperatures and longer

burning periods, which native understory plants cannot survive. Pinelands in Miami-Dade County where *Dalea carthagenensis* var. *floridana* occurs are subject to this threat.

The R. Hardy Matheson Preserve, which wraps around Fairchild Tropical Garden and the Deering Estate has many invasive exotic species and would benefit from removal of exotic pest plants as part of ongoing maintenance. Prescribed fires are conducted at both Matheson and Deering. The latter site benefited from intensive hand removal of exotic vines and shrubs after Hurricane Andrew in 1992. *D. carthagenensis* is monitored at both of these sites by Fairchild Tropical Botanic Garden. Overall, the populations at these sites appear secure as long as current management procedures continue and new facilities or roadways are not constructed.

Exotic plant control using labor intensive methods such as hand chopping followed by spot herbicide treatment is feasible at small, intensively managed sites in Miami-Dade County, but not for the Big Cypress National Preserve. Melaleuca (*Melaleuca quinquenervia*) has been a severe problem in the Big Cypress National Preserve, now coming under control, but Old World climbing fern (*Lygodium microphyllum*) is now spreading southward into Everglades National Park and is expected to be present in most of southern Florida in a few years. This fern is capable of smothering vegetation (Ferriter 2003, Volin et al. 2003).

Existing populations of this species appear to be so small that they are not likely to be viable, at least in Miami-Dade County.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

Miami-Dade County is sponsoring the GIS mapping of NFCs. This project was completed in 2005 with additional mapping of selected species underway in fall 2005. This project is improving management of public conservation lands. The Service cooperates with Miami-Dade County but has not entered into formal agreements for the conservation of its listed and candidate plants.

SUMMARY OF THREATS (including reasons for addition or removal from candidacy, if appropriate)

The primary threat to this species is loss of its pineland habitat in Miami-Dade County, where it is now exceedingly rare. There is hope that recently-discovered populations to the west in Big Cypress National Preserve may prove to be larger and more secure.

For species that are being removed from candidate status:

___Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE)?

RECOMMENDED CONSERVATION MEASURES

Reintroductions and monitoring/management of the remaining small populations in Miami-Dade County are essential. Conduct further surveys in the Big Cypress region.

LISTING PRIORITY

| THREAT | | | |
|---|---|---|---|
| Magnitude | Immediacy | Taxonomy | Priority |
| High | Imminent | Monotypic genus | 1 |
| | | Species | 2 |
| | | Subspecies/population | 3 |
| | Non-imminent | Monotypic genus | 4 |
| | | Species | 5 |
| | | Subspecies/population | 6 |
| **Moderate** to Low | **Imminent** | Monotypic genus | 7 |
| | | Species | 8 |
| | | **Subspecies/population** | **9*** |
| | Non-imminent | Monotypic genus | 10 |
| | | Species | 11 |
| | | Subspecies/population | 12 |

Rationale for listing priority number:

*Magnitude*: Only small populations of this plant remain in Miami-Dade County on small tracts of conservation lands that are vulnerable to invasion by exotic pest plants and to lapses in management, including lack of adequate prescribed fire. The populations in Big Cypress National Preserve do not appear to be large, and thus may be vulnerable to random events, as well as exotic pest plant invasions, with Old World climbing fern the chief threat. However, because the threats from invasive species are being controlled to some extent (e.g., controlled burns are being conducted on Miami-Dade conservation lands and biological control agents are being developed for Old World climbing fern), the magnitude of threats overall is moderate.

*Imminence*: Threats to three out of five Florida prairie-clover populations in Miami-Dade County are imminent. The threats from lack of fire and invasive species are ongoing; conducting prescribed fires in urban areas is difficult, as is controlling exotic pest plants. The remaining urban conservation lands where this plant occurs require regular maintenance. Threats to the two populations in Big Cypress National Preserve may be non-imminent, largely because a fast-spreading pest plant, Old world climbing fern, has not yet arrived in the area.

Rationale for Change in Listing Priority Number (insert if appropriate): N/A

Yes Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? No. There are no urgent problems, such as collection for medicinal purposes that would necessitate an immediate listing of this species.

DESCRIPTION OF MONITORING: Fairchild Tropical Botanic Garden is conducting monitoring and experimental work (Carroll 2005) on this plant at the R. Hardy Matheson Preserve. Fairchild also monitors this species at the Deering Estate at Cutler (where plants were accidentally mowed on a right-of-way in February 2005 and corrective action has been taken), and Crandon Park. Fairchild is monitoring one population on private land, in a pineland behind an urgent care center. Although this site was partially (illegally) bulldozed during 2005, the *Dalea* plants were untouched (J. Possley, Fairchild Tropical Botanic Garden, pers. comm. 2005). We believe that routine maintenance of County-owned pinelands, including prescribed burning and removal of exotic pest plants, helps ensure the persistence of all of the vegetation's endemic plants. A project to map NFCs (including pinelands) in the county has greatly improved information on the extent and condition of pinelands. Because of this and other projects, Service personnel are in contact with Miami-Dade County land managers and local botanists. This is sufficient for the Service to monitor the overall progress of pine rockland conservation. Service personnel are also in regular contact with local conservation organizations, including Fairchild Tropical Botanic Garden and The Institute for Regional Conservation, which tracks localities for plants of conservation, along with field work for the Miami-Dade mapping project. The Service is also in regular contact with the National Park Service with respect to Everglades restoration and is an active participant in information sharing on exotic pest plant management in south Florida**.**

COORDINATION WITH STATES
Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment: none

Indicate which State(s) did not provide any information or comments: Florida.

LITERATURE CITED:

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Isely, D. 1990. Vascular flora of the southeastern United States. Vol. 3, part 2: Leguminosae (Fabaceae). University of North Carolina Press, Chapel Hill. xvii, 258 p.

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U.S. Census Bureau. 1998. State and Metropolitan Area Data Book 1997-1998.

U.S. Fish and Wildlife Service. 1999. South Florida multi-species recovery plan. Atlanta, Georgia. 2172 pp.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: /s/ Jeffrey M. Fleming 11/16/2005
Acting Regional Director, Fish and Wildlife Service Date

Concur: _____ August 23, 2006
Acting Director, Fish and Wildlife Service Date

Do Not Concur: _____ _____
Director, Fish and Wildlife Service Date

Date of annual review: October 2005

Conducted by: South Florida (Vero Beach) Field Office